

TERRA

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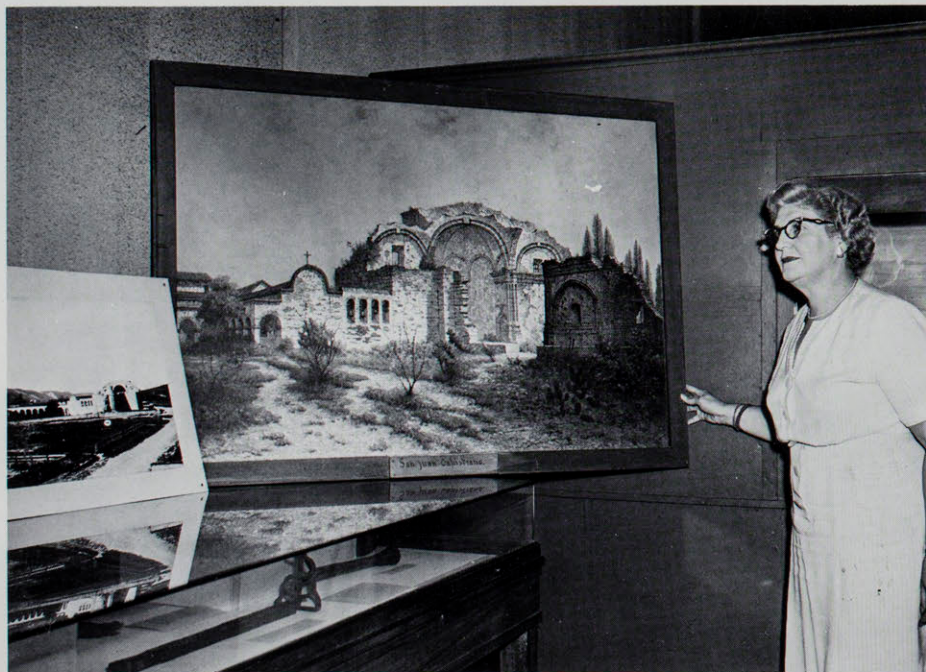


MUSEUM ON THE MOVE

This spring the Natural History Museum of Los Angeles County has moved farther out of its parochial boundaries to serve the people of Los Angeles County. In addition to our Exposition Park and Hancock Park facilities, we have found a way to widen our sphere of influence and better serve the people in eastern Los Angeles County. In April the Workman-Temple Historic Landmark opened in the City of Industry on the site of the home of one of the first overland pioneers in the Los Angeles area, William Workman. The facility belongs to the City of Industry, but is administered by the Natural History Museum of Los Angeles County. This cooperative project gives strength to us both. The Museum can extend its programs and research; the City of Industry is provided with a built-in curatorial staff and a wealth of expertise about California history. The Workman-Temple Historic Landmark deals with a specific theme, namely the history of early Los Angeles reflected through the Workman-Temple family homesteads.

I welcome the added bonus of broadcasting the Natural History Museum and its expanding programs to the many visitors who will enjoy the lovely grounds and splendid historic restoration of the Workman and Temple homes in the City of Industry. And I applaud TERRA for featuring the new member of our Museum family.

William B. Lee, Director



CURATORS & COLLECTIONS

RUTH TONE MAHOOD 1908-1981

Ruth Mahood, chief of the History Division for twenty-eight years, from 1954 to her retirement in 1969, died recently on her way to Mexico.

Miss Mahood, brought up in Edmond, Oklahoma, began her California teaching career in 1943. Three years later she was employed as a history instructor in the Museum Education Division where she taught school classes visiting the Museum, planned the Documentary Film Series each year, and helped in the Lending Service.

In 1953 Arthur Woodward, Chief of the History Division, retired, and a year later Ruth Mahood was appointed the new Chief of the History Division. Because of her work many artifacts were contributed and a number of valuable collections were given to the Museum. Miss Mahood also lectured for several programs, such as the Museum History Workshop for high school students and the Docent Roundtable. She was active with the Museum Alliance and was an honorary member of the Board at the time of her retirement.

TERRA

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COVER

The main entrance to La Casa Neuva at the Workman-Temple Historic Landmark in the City of Industry.

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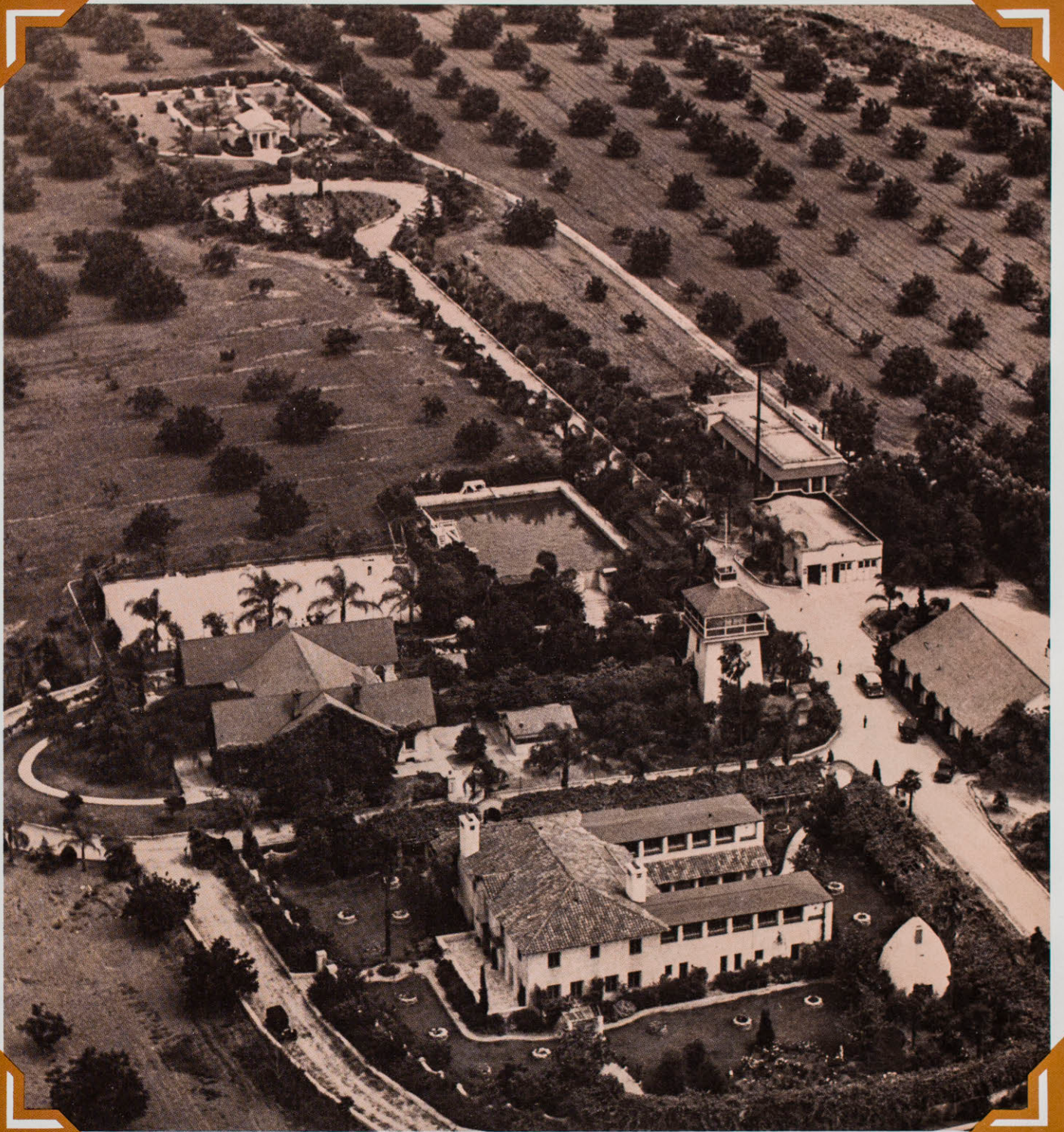
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Aerial view of the Workman-Temple Homestead in the 1930's.

The Homestead

An Oasis of Older California

by KILBEE BRITTAIN



Julian Workman

William (Don Julian) Workman.



The Workman-Temple brand.



F.P.F. and Antonia Margarita Temple, 1872. Antonia was the only daughter of William Workman.



John Temple and his wife Anita with their children Frank, Pliny and Edith in front of the Workman home in 1889.



Thomas ("Tomito")
Workman Temple II.

When he was a little boy, Thomas Workman Temple II liked exploring the hills above what is now Montebello, looking for blue-bellied lizards to catch with nooses made from stripping down wild oats. In 1916 there were few homes or roads nearby, just two railroad lines cutting through the La Puente Valley, and vast open spaces divided into ranchos growing fruit, nuts, grape vines, grains. Cattle, sheep, and horses vastly outnumbered people.

As he climbed the hill above the present intersection of San Gabriel Boulevard and Lincoln Avenue, nine-year-old "Tomito" skirted puddles from the morning's rain. Looking closely at rainbows streaming on the water's surface, he saw bubbles popping up, and recognized the smell of gas.

He raced home. "Dadup!" he called to his father, "I found oil for you!"

To humor their excited son, Walter P. Temple and his wife Laura Gonzales (born at Rancho La Merced) climbed the hill with him. Tomito handed his father the frying pan he'd brought along, they ignited a flame from the gaseous puddle, and whatever they cooked must have tasted like ambrosia. The family used that spot for picnics frequently thereafter, making the gas source heat their food.

After Standard Oil of California had drilling success, Walter P. Temple named the first wells Laura One, Two, and Three.

Tomito's discovery of the Montebello oil field enabled Walter P. Temple to restore his family's prominence, to buy back the original homestead of his grandfather William Workman, and to build a remarkable Spanish Revival mansion which he named La Casa Nueva.

Workman's adobe-turned-English-manor and Temple's Casa Nueva together comprise "The Homestead." This

Workman-Temple Historic Site is being restored by its owner, the City of Industry, which has contracted with the Natural History Museum Foundation of Los Angeles County to operate the six-acre park as a cultural, educational, historic resource. The site includes El Campo Santo, the region's earliest-known private family cemetery, and the Pio Pico Gallery, the exhibition and education center.

The early history of the La Puente area is rich with stories of Indians, missions, and Mexican governance. But the story of the Workman homestead itself begins in a small English village, Clifton in Westmoreland County, where William Workman, one of eight brothers and sisters of good family, looked toward the United States as a land of greater opportunity and adventure.

William Workman (b. 1800) landed in New York when he was sixteen, and soon moved west to Missouri. One of his brothers, David, also emigrated to Missouri, where he became a saddler. In 1823 William joined a spring caravan headed for the Mexican settlement of Taos, lured by business opportunities, including the fur trade.

Soon after his arrival there he became friends and business partners with John Rowland. Both married daughters of Spanish land owners, having first necessarily converted to Roman Catholicism, and applied for Mexican citizenship. They ran a store specializing in furs, developing a broad acquaintance with Indian and Yankee trappers. One of them was Kit Carson, who in his teens had been sought as a runaway apprentice from the Missouri saddlery of William's brother David. Carson told Workman and Rowland about the riches in sea otter fur trade in California, a land doubly attractive in light of the decline in the beaver fur trade around Taos because of overtrapping.

Rowland made a preliminary journey, dangerously solitary, returning from California to persuade the Workman family to move West. New Mexico Governor Armijo was becoming increasingly despotic, especially suspicious of all foreigners since Texas had won independence from Mexico in 1836 and was said to be mounting an expedition to annex New Mexico. In fact, Rowland and Workman were supposedly aware of the plan.

In 1841 John Rowland and William Workman joined a wagon train in Santa Fe, but then split off with some forty-five companions at Abiquiu, taking a southern route from New Mexico through rough mountain and desert country into the San Gabriel Valley, probably ending at the San Gabriel Mission. After two months of hardship, they completed their journey on November 4, 1841, the first emigrant train to reach Los Angeles by an overland route. Accompanying Workman were his wife, Nicolasa Uriarte, his nine-year-old-son Joseph, and his eleven-year-old daughter Antonia Margarita.



The Workman House in 1981. The arbor once provided a shady setting for festive parties, as shown in inset.

Workman and Rowland applied for a land grant of the lush La Puente Rancho which they had passed just before they reached the Mission. The rancho had fertile soil and ample water from the oak-surrounded San Jose Creek and San Gabriel River. They were so persuasive, being fluent in Spanish and knowledgeable in Mexican ways, that within three months Mexican Governor Alvarado in Monterey awarded them 48,790 acres for \$1,000. The padres at the nearby mission, whose granary had been on the acreage, cautioned Workman and Rowland to care for the Gabrielenos Indians in the nearby Awigna Village.

The partners shared the land until they legally divided it in 1867, after fifteen years' struggle in the courts. Workman took the western half, Rowland, the eastern.

In 1842 Workman had local Indians build an adobe on a knoll overlooking the La Puente Valley and San Jose Creek. Huge timbers were hauled by oxen from the San Bernardino Mountains. The simple adobe was soon enlarged. With bricks made at the site, Indians constructed a U-shaped hacienda, one storey living quarters, another a basement area of kitchen, two wine cellars, and a storage space, with a hidden well which was used to advantage once in a three-week Indian siege. There is a persistent story of a now-blocked tunnel leading from the well toward the cemetery, evidently an

escape route. The adobe included shops necessary to make the rancho independent, including a blacksmith. Between the two wings was a patio with a grape arbor and orange trees. The ornate south entrance gate was topped with an elaborate doveote.

Workman prospered, raising cattle and later wheat. His neighbors knew him as Don Julian, but he never forgot his English heritage. The cellar, for instance, was not like other adobes of the period. It was, according to one source, "built by a man born to the traditions of another clime and country."

One fall day in 1842, Don Julian (William) Workman brought his wife and daughter to shop at Don Juan (Jonathan) Temple's store in the nearby Pueblo de Los Angeles. Don Juan was noted for importing Oriental goods and the finest calicos and dimities from Salem and Boston.

Don Juan (b. 1796), seventh-generation

descendant of Abraham Temple, who left England for the New World in 1636, arrived in California in 1827, having left his Boston home to sail with his friend Captain William Dana for the Sandwich Isles and ultimately California. Don Juan became a pioneer Los Angeles merchant, friend of the powerful and political like Pio Pico, marrying wealthy Rafaela Cota of Santa Barbara, fighting embargoes on his hide shipments, purchasing Los Cerritos Rancho and building the casa later owned for a century by the Bixby family and now by the City of Long Beach. Don Juan even leased the Mexican Mint for years.

Back in Boston, Don Juan's half-brother wanted to visit the older brother he had never met. Nineteen-year-old Pliny Fiske Temple (b. 1822), named for a renowned Congregational preacher, thus sailed for California in 1841, with his mother's permission to visit Don Juan for a year. (He didn't return, in fact, until 1870, to



TOP: La Casa Nueva courtyard with millstone fountain.

RIGHT: Walter P. and Laura Temple with their children.

place his sons in Harvard and M.I.T.) After 156 days around the Horn to Monterey, another schooner to Santa Barbara, and an overland trip to the Pueblo, Pliny, or F.P.F., as he became known after he adopted Francisco as his Catholic conversion name, joined Don Juan in the mercantile business.

And there he was, a shy, short, blond clerk, waiting on Dona Nicolasa and Antonia Margarita while Don Julian (William) Workman talked with Don Juan Temple about the recent gold strike, and political troubles brewing.

It was love at first sight for Antonia, but when F.P.F. had still not proposed after numerous meetings, Antonia went to stay with her godmother's family, which included her godmother's brothers, Don Pio Pico and General Don Andres Pico. The general soon began to court Antonia, but she told him she was pledged to another. Eventually after she returned home to Rancho La Puente, Don Juan Temple appeared at the Workman adobe to arrange the marriage of his half-brother to fourteen-year-old Antonia.

F.P.F. and Antonia were married September 28, 1845, at the San Gabriel Mission. Eighteen months later Thomas



Workman Temple, first-born of the Temple-Workman union and namesake of the little boy who discovered the oil many years later, was born. Ten children followed.

By 1845 California was in political turmoil. F.P.F. Temple wrote his brother Abraham in Boston that trouble wouldn't hit his area while the drought continued, because there wasn't enough grass to fatten the horses, and "Californios can not fight unless they have something to run away on."

At first William Workman and F.P.F. Temple sided with the Californios against Micheltorena at Cahuenga, but changed allegiance when it appeared the United States would prevail. Workman assisted as commissioner in the negotiations between sides leading to the United States' acquisition of California.

The ensuing years were good to the Workman-Temple families. In 1849 F.P.F. Temple was granted the western portion of Rancho La Merced, near the Workman property. He became increasingly active in Los Angeles real estate and business. Taking advantage of mushrooming prosperity in the Los Angeles area, he convinced Workman to join him in forming the city's first bank with I. W. Hellman. Later, because of a difference in business philosophy, Workman and Temple formed their own bank.

William Workman became involved in selling cattle to miners in the 1850's. His

brother David came West several times, finally bringing his family to live at the Workman adobe. In April 1854 David was driving cattle from Rancho La Puente to the mines when his mule stumbled, throwing him over a 200-foot cliff to his death. In spite of his early exit from this story, it is David's descendants who form the extended Workman family in Los Angeles today.

David was the first to be buried in the red brick Gothic chapel William built in the family cemetery plot, in the manner of his English forebears as well as the California rancheros.

When he was an affluent, respected seventy, Don Julian (William) Workman transformed his adobe hacienda into a sort of English manor house, partly from veneration of his own heritage, and partly because Eastern styles were becoming fashionable in California. He hired famed architect Ezra Kysor, whose accomplishments included Los Angeles' Pico House, St. Vibiana Cathedral, and Mt. Pleasant House, to transform his U-shaped adobe into an H-shaped manor with steeply gabled roofs and Norman arched windows, using brick and stucco colored and stencilled to represent stone. It is this period of the Workman home that is considered most significant by architectural historians, who look to the "flow of history" which indicates that prime time for a building is at the apex of its owner's influence and its own style. At the Home-

stead, cultures combine an English heritage married to an Indian and Mexican culture to make an important historical-architectural statement. Restoration of the Workman Homestead focuses on this period.

But the Workman-Temple lives of affluence and influence were about to be smashed by a general bank crisis beginning in northern California and creating a rush on Southern California banks. Admirable and stable as father and son-in-law had proved themselves in other fields, they evidently were not expert bankers. After a series of disastrous loans, they were forced to borrow from Lucky Baldwin, putting up their lands as collateral.

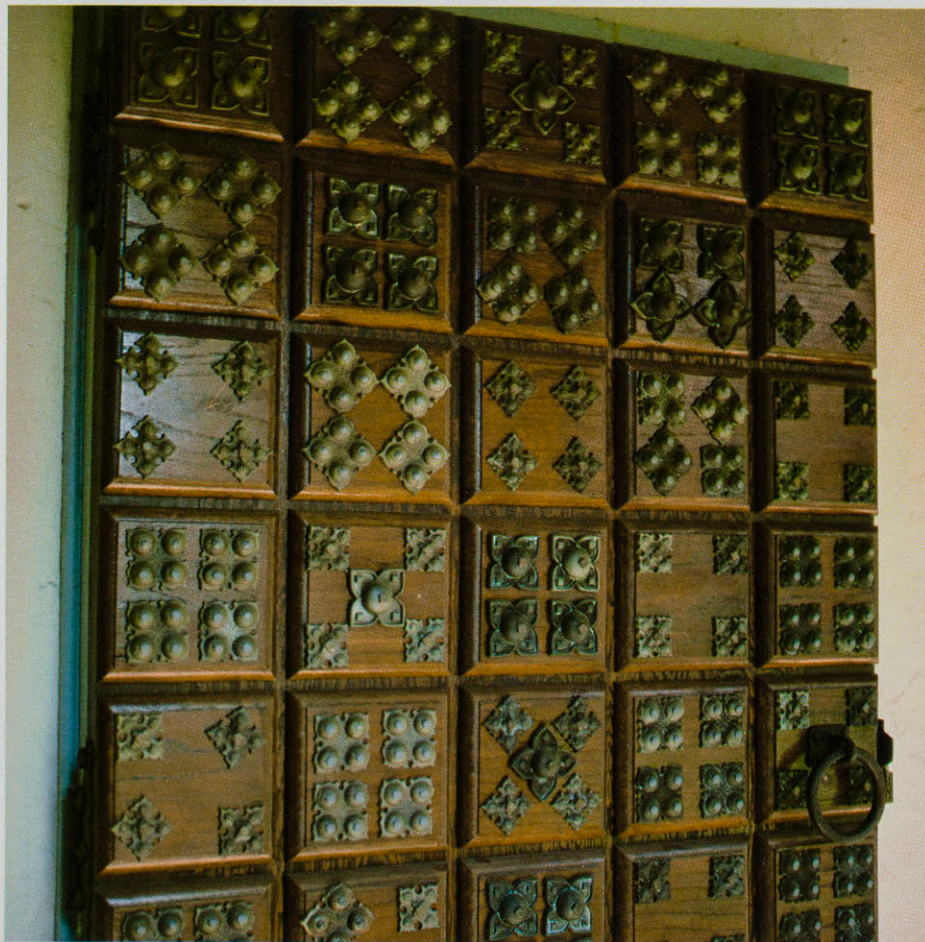
Nothing worked. They became bankrupt, and lost most of their lands. Don Julian (William) Workman shot himself in the first-floor office of his adobe-turned-manor. F.P.F. Temple died of a heart attack in the corner of his sheep shed.

Dona Nicolasa Uriarte de Workman and her daughter Antonia Margarita Workman de Temple, both born in Taos, both lived fifteen more years.

Of F.P.F. Temple's eleven children, the youngest, Walter P., figures most prominently in the story of the Homestead.

Walter, his wife Laura, and their four children, Thomas Workman Temple II, Walter (Wally), Edgar Allen Poe, and Agnes, lived near the old Homestead. After the lure of lizards on Montebello Hill resulted in Thomas (Tomito, later Tomas) discovering oil, Walter P. Temple used the funds in 1919 to purchase back seventy-five acres of grandfather William (Don Julian) Workman's homestead on Rancho La Puente. The family lived in the Workman home while building the adjacent sixteen-room Casa Nueva.

The Spanish Revival mansion was designed by Walter and Eisen of Los Angeles from the Temples' own concepts. But the plans were frequently modified as the building progressed and the Temples' ideas changed. Master-carpenter Sylvester Cook of Montebello was the builder, using Mexican labor to make adobe bricks baked in a kiln fired with walnut tree trimmings. The house bears many personal touches. Laura was a devoted Roman Catholic, and was responsible for the religious aspects of the decor. Photos of Agnes and Tomas served as models for the stained glass windows on either side of the ornate front door. Other windows told the Rowland-Workman story and early California history. The decor was rich in ceramics and both cast-iron and wrought-iron. Heads of family pets were carved on the ends of huge beams projecting over the patio. One was a German shepherd named Prince who followed Walter P. Temple everywhere.



Example of artisans' decorative work inside La Casa Nueva.



Walter's second son Wally remembers riding bikes around the foundations with his brother Edgar before the house was built.

A Mr. Johnson did most of the ornate concrete work on the massive walls surrounding the mansion, adding leaves, vines, fruits, and animals. Wally recalls that Mr. Johnson whacked a lizard with a shovel, and planted the corpse in the wet cement, its outline plainly visible thereafter.

Workers ploughing fields found pieces of china from the Workman home. Tomas had the idea of setting the fragments into the walls and walks.

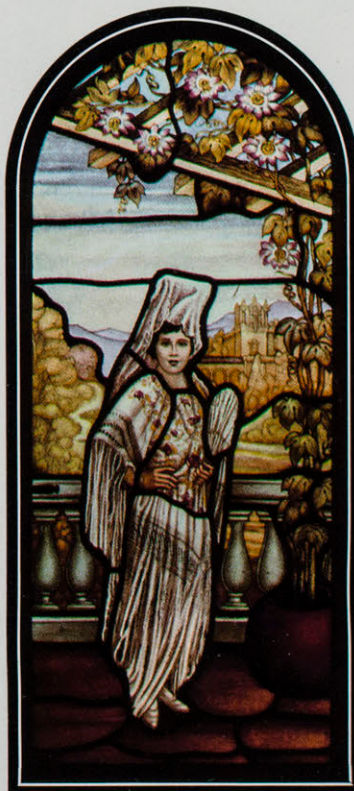
The work went well. Gabriella Sutter, formerly widow of Tomas Workman, recalls Tomas' fond descriptions of his mother. Laura Temple was full of jokes, old Spanish sayings, and original ideas for each situation. They were a musical family. Laura, Tomas, and Agnes played the piano, Walter the violin and guitar, and, later, Wally and Edgar played saxophone in the Rose Parade.

Life was full of promise, the house more than half-finished, when Laura Temple died a few days after Christmas in 1922. The family determined to finish the house in her honor. It was blessed by the Rev. John J. Cantwell, Bishop of Los Angeles and San Diego, on December 28, 1923, and the family moved in. Walter P. Temple however, refused to sleep in the master bedroom planned for Laura and him, and lived downstairs.

Walter, remembered as a genial, funny man, played a searchlight on an American flag on top of the water tower to guide the first airmail planes to March Field, and had the Edison Company install an eighty-foot antenna on top of the recreation hall for the piano-sized radio inside. The antenna remained until Wally (who recalls himself as a devil) and Edgar shot through the wires while zapping blackbirds with 22's.



Clockwise from upper left: La Casa Nueva dining room; exterior tiled stairway in courtyard; gold-leafed carved beam in entrance hall; stained glass windows flanking front door (Agnes and Tomas Temple).





Family pets carved on ends of huge beams above La Casa Nueva courtyard.



Stained glass window on landing of the reception hall of La Casa Nueva, a symbolic composite of Mexican California.



Standing on balconies on either side of the recreation hall, the brothers hit resident bats at each other with tennis racquets until their father found out. Then they turned to catching crawfish, frogs, and perch from the year-round San Jose Creek for the cook.

The children enjoyed their home, the large pool, tennis courts and movie theater. Wally Temple remembers looking out his window on the east, Pomona side of the casa, at walnut trees and the eucalyptus grove on Puente Hill. The road up the hill included a dangerous S-curve, where "a load of sheep turned over and everyone had lamb stew for a month."

But after a few years, Walter P. Temple sent his children away to school, and began spending more and more time in the Teepee, his office-retreat on the casa grounds.

"Life would have been a different story if Mother had lived," Wally Temple muses.

By the time the stock market crashed, Walter P. Temple put the homestead land in a corporation, but his partners took out a loan and left him broke. This second time around, the Homestead property was lost to the Trust Department of California Bank, which leased it in 1930 to Major Lawrence V. Lewis for his Golden State Military Academy, later named Rainford Military School for Boys. A former teacher reminisces that the boys were said to have been fed on seventeen cents a day, water was heated once a week for baths, and teachers were paid thirty dollars a month, plus room, board, and laundry.

In 1940 the bank sold the property to Harold Brown, who operated the two houses as the El Encanto Convalescent Home, now situated in modern buildings just north of the Homestead.

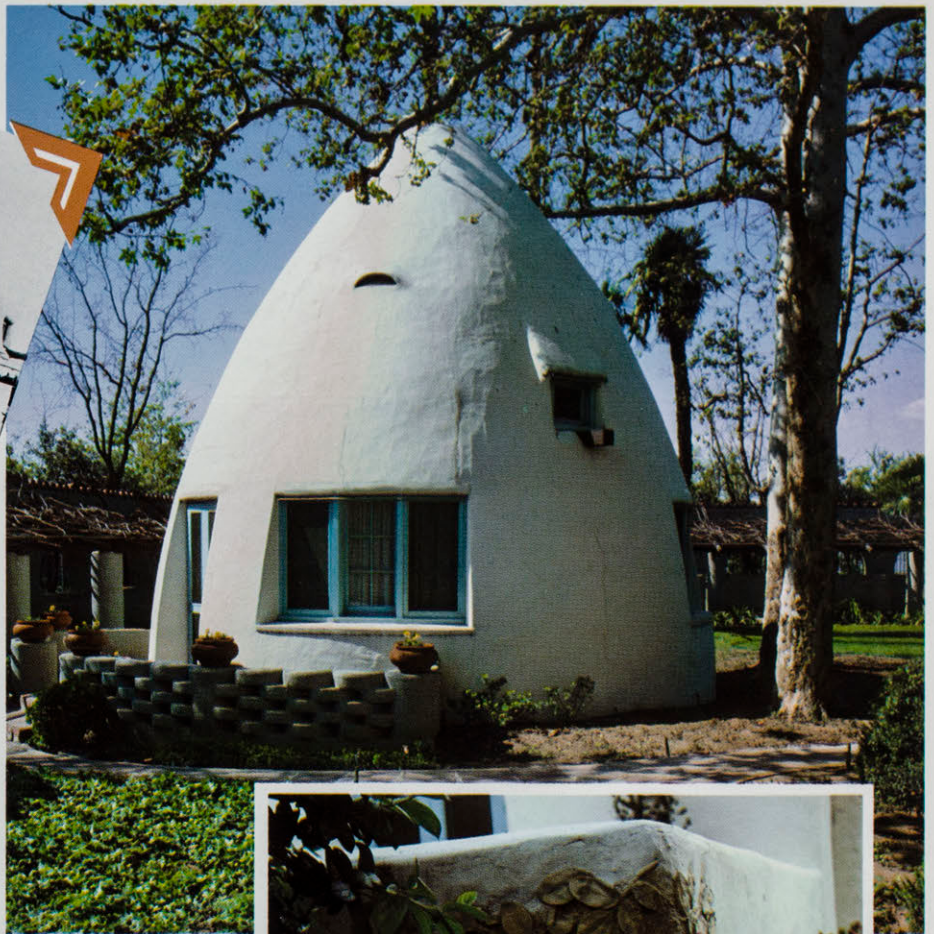
Some years after the City of Industry was incorporated in 1957 and became a successful center for the manufacturing and distribution of industrial products, the city government formulated a plan of development including reference to historical and cultural life. The plan recognized that the Workman-Temple Homestead was an essential reminder of the San Gabriel Valley's heritage. In 1976 the City of Industry began a million-dollar restoration of the Homestead under the direction of restoration architect Richard Girvigian.

The story of this exacting task should be a book in itself. Research, reminiscence, and modern restoration techniques are all fascinating. During the process and after its completion, a kaleidoscopic view of the Valley's history will be laid out for the public, not only in the Pio Pico Gallery, but also in the surrounding acres.

The Workman adobe-manor, La Casa Nueva, the Pio Pico Gallery, the glorieta ornately ready for its band concerts, the water tower waiting to fly its flag, all these parts of the Homestead are to be



Clockwise from top: The Tepee (Old Smokehouse), Walter P. Temple's office retreat, with inset of family costume party in progress; stucco detail of citrus and lizard on exterior wall; stained glass of Sancho Panza with windmill, and Schubert.



studied and enjoyed.

But one should also take a walk.

The Memorial Walkway, bordered in Chinese elms rustling and swaying their copious branches on a mild spring day, leads past a lily-pad pool with carp and a heart-shaped flower bed laid out by Walter P. Temple to the old cemetery and the Greek mausoleum Walter built in 1919 to replace the brick chapel destroyed by fire.

Sad cypress droop their black-green branches. The elegant black iron fence encloses a green acre damp from zealous gardening, pocked with flat and upright gravestones. "To Father at Rest." "To Mother at Rest." "Gone Home." There are stones for sons of Mrs. Anita D. Temple, John and Adrian, both dead in their prime in 1934—"a tragic accident, but Mother took it like a trouper," recalls their sister, Edith Temple Stanton (F.P.F. Temple's granddaughter), now ninety years old and very sparky.

The chapel is cool, quiet, dignified. The small rectangular wall crypts are clearly marked. William Workman and Nicolasa lie next to good partner Rowland. Pio Pico, last governor of Mexican California and dear friend, was moved to a crypt near Workman when his North Broadway, Los Angeles, burial ground was ripped up for "progress" in 1921. And here are David Workman, F.P.F. and Antonia Margarita Temple... One is readily caught up in the solemnity and history of the small building.

Outside in bright sun, gardeners chatter in Spanish and clip away at grass obscuring names like Didier, Yorba, Pico. Across the now-open grassy expanse to the west, where the City is going to build





The glorieta, focal point of the western end of the Pio Pico Memorial Walkway, is typical of those erected in Mexican plazas.

Cast iron gate to the cemetery (El Campo Santo) and mausoleum.



a medical center, a bird calls a sharp single note. One knows that cities and suburbs press close by, but they seem far away. Because Don Julian (William) Workman and his partner Rowland bought the land, and because Tomas Workman Temple II found the oil so his father could buy the family land back, this Homestead full of bones and memories and buildings remains available for the people of every descent to learn from and enjoy.

The life of early Los Angeles was lived out not just in trade in furs, tallow, hides, cattle, wine, grain and those twin goddesses gold and oil, but also in the long hard work of rancho administration, animal husbandry, and agriculture, and in the conflicting energies of politics. Indians, Mexicans, and immigrant Americans achieved an amazing amalgam from their different cultures. Architectural styles as well as bloodlines blended. Yankee Jonathans became Juans, Congregationalists became Catholics. A New World provokes people to dare to be different, and early California offered its settlers no less a challenge.

Workman and Temple embraced that challenge, and though their lives were personally tragic in their last days, their families and endeavors continue as great blessings on our Southern California life.

Sources:

Material for this article was compiled from information made available by the staff of the Workman Temple Historic Landmark at the Homestead, from Thomas Workman Temple II's lectures to members of Los Cerritos, from the Workman Family History made available by the Honorable David A. Workman, and from conversations with Wally Temple, Edith Temple Stanton, and Gabriella Sutter.



Kilbee Brittain is associate editor of TERRA.

TRADITIONAL SIAPO ART FROM WESTERN SAMOA

by AIONO SIA MALIETOA

Photos by DICK MEIER



Traditional Samoan society was closely intertwined with the environment. The people observed their ceremonies, recounted their history, loved their children, respected their chiefs and buried their dead in a society that was close to the earth, sky and sea.

This closeness to the elements is reflected in the traditional siapo art of the people. 'SIAPO' is a rubbing of traditional patterns onto an unwoven cloth, beaten from the inner bark of the paper mulberry tree (*Broussonetia papyrifera*). It is an art form that preserves more than a thousand years of Samoan artistic tradition. Complete understanding and enjoyment of these works can come only after examining the society in which they were used and the ceremonial context that surrounded their making.

Western Samoa is an independent nation in the South Pacific, the first independent Polynesian nation in modern

times. It is distinct from American Samoa, an internally self-governing Territory, under the supervision of the Department of the Interior in Washington.

Western Samoa is composed of nine islands, all volcanic in origin. The largest is Savaii, still relatively undeveloped. Upolu, next in size, has the largest concentration of people. The capital city of Apia, the center of business and administration and the seat of government, is on Upolu. Most of the islands in the group are inhabited.

Savaii, in Samoan legend, is the 'HAWAII' of the Anthropologists—the "home" of the Race, the cradle of Polynesian civilization. Legend further says, that it was from Savaii, that Tahiti, Tonga, Hawaii and New Zealand were colonized. This legendary belief has been kept alive through song, chants, dance and by word of mouth, all agents of the traditional record of the Samoans.

The system of government is a mixture of cultural traditions and western democracy—a reminder of New Zealand Administration in the early half of the twentieth century. Government has an Executive Body, made up of a Prime Minister and eight Cabinet Ministers, a Legislature of forty-seven members (including the Executive Body) and a Judiciary. Forty-five of the Parliamentary members must be 'MATAI' (chiefs) elected by other Matai. Universal suffrage, characteristic of western democracy, is not a feature of Samoan democracy. The system, however, works very well, the Samoan way. Over this structure, with the ultimate right of veto, is a Head of State. Before Independence in 1962, a Plebiscite made Malietoa Tanumafili II and Tupua Tamasese Meaole, Joint Heads of State for life. The latter passed away in 1962, leaving Malietoa Tanumafili II the sole Head of State for life. He is the Head of the



Examples of siapo cloth by the author.

Malietao family, one of the four royal families in the country. And though not constitutionally stated, the implication is that the holder for the Office of Head of State should be from one of the four royal families of Samoa. Traditions and western democracy, therefore, are well and truly blended. Here is an indication, also, of the strength of Samoan customs, which has allowed the people to preserve their heritage intact despite long and constant contact with the outside world.

Everyone can speak and write Samoan, and almost everyone can speak and write English. Missionary activity in the 1830's was mainly responsible for stamping out illiteracy in the islands, but it was not powerful enough to stamp out the more unique aspects of the peoples' way of life. Christianity was inserted into the cultural life of the people in such a manner that it became a Samoan entity to be practiced the Samoan way. It is another indi-

cation of the strength of the cultural heritage of the people, that gave the push to many developments, visible and invisible, in daily living, be it government, religion or art.

The climate is tropical, hot, and wet, a combination that makes for high humidity. Daily conditions, though, are cooled by the southeast trade winds that blow for over six months of the year. Between October and March, the northeast trade winds bring heavy rains and hurricanes, accepted by the people as merely a small part of their life cycle, like birth, marriage and death. The islands enjoy 2500 sunshine hours a year with annual rainfall averages of 80" along the coasts, rising to 100" at higher elevations toward the interior.

The seas around the islands are some of the richest fishing grounds in the world, and the waters also are some of the clearest. Farther out, the coral reefs and sand-

bars enclose tranquil lagoons hemmed in on the landward side by beaches once the center of communal meetings before and after a fishing excursion.

The volcanic soils are very fertile and excellent for the growth of many tropical fruits like mangoes and papaya. The same soils support the luxuriant tropical forests that were once the source of many forest that were once the source of many and valuable hardwoods for dwellings, canoes, all-purpose tools and weapons of all kinds. From the undergrowth came liana vines, wild orchids, berries and other bushes and plants including the ti plant, that were used for a variety of purposes—edible, medicinal or purely decorative. The inland mountains rise to heights of over 6000 feet, with waterfalls and underground springs scattered everywhere.

Settlement always hugged the coastlines in tribal communities which ranged



in number from less than a hundred to several hundreds. Coastal settlement suggests something of the deep and often unexplained superstition that pervaded the daily lives of the people. At the coasts, the reality of the sun rising and setting could never be disputed. Objects, therefore, were easily placed in their environmental contexts. In the forests, even in daylight nothing was sure. The sea close-by provided food, while the pandanus tree, a ready source for flax to weave mats and baskets, grew abundantly along the coasts. Additionally, since most travel was by sea, it was more convenient to man canoes by living on the coasts.

This is the physical environment in which the Samoans developed a social system based on 'MATAI' (chiefly) leadership and communal living. Then, as now, there were matai whose power extended only over village boundaries and there

were many of these. A few presided over districts composed of several villages. Finally, there were those whose prestige extended over the whole country. There were, and still are, four. Territorial size reflected the status of the matai, but national or provincial, the principle of matai leadership was the same. He held absolute power over his extended family and lands. His authority and prestige were protected first by his own 'MANA' (supernatural power), believed to have come directly from the gods. Mana, in turn, was protected by 'TAPU,' the sacredness of a chief. Fear of these, kept law and order. Besides, there was a complex code of behavior, unwritten, but clearly understood. Violations were punishable by public beatings, expulsions and ostracism. To be punished publicly was to lose face, a fate worse than death and a powerful behavioral check in itself.

It was a society in which the individual existed only as part of a whole. One that was enmeshed in ceremonies with almost every daily event. In the event of a wedding, for instance, the couple was only an excuse to have a ceremony. It was an excuse to don ceremonial garments, an excuse for the orators to pit their verbal skills against each other and for the village to give and take gifts. The most memorable part of a wedding then, was not the married pair, but the presentation of traditional gifts between the families of the bride and groom. The bride's dowry was household items like mats, cooking utensils, fine mats and as much siapo cloth as possible. The groom's family presented the equivalent of cash. In old Samoa, cash meant all types of food including whole pigs. The quantity of the gifts was an indication of the material strength of a family. Whatever the occasion, the siapo cloth was always around, to be handed over.

The Samoans trace the origins of siapo to a legendary woman named Sina. She seems to have been one of the many characters of old Samoa who was half-human and half-divine, and thus able to perform tasks that humans could not. Sina planted the first coconut tree from the head of an eel and made the first siapo to cover herself. Before the use of the siapo, the daily wear consisted of garments made from the leaves of the ti (*Cordyline*) plant, or from the bark of the 'fau' (*Hibiscus*) tree. Unpatterned siapo cloths were reserved for formal occasions and also for the use of the paramount Chiefs and their immediate families, another of the many outward expressions of the 'apartness' of High Chiefs. The siapo cloth originated as a simple item of clothing, something useful, something necessary, without the trimmings, and definitely without any artistic aspirations and ambitions.

Gradually, the siapo cloth assumed different functions. A religious element became unconsciously associated with its

use before the patterned era. In the absence of coffins, for instance, the dead were wrapped in siapo cloths scented with coconut oil. The idea was to contain the spirit in the best way possible for a safe journey back to 'PULOTU,' the home of all spirits. It was believed that failure to do this well, would result in the spirit wandering, causing all manner of evils. The deep superstition of the people generated this practice, and served as a direct and practical justification for siapo making. The same superstition explains the persistence of this practice today.

From a simple item of clothing, the siapo developed into a prized and intrinsic part of the socio-economic life of the people. Very likely, this development came with the advent of designed and patterned cloths. Thus, in addition to its former functions, the siapo became a decorated item that was prized for its gift value and one that now formed an invaluable part of a bride's dowry and became a

The Natural History Museum of Los Angeles County is currently presenting an exhibition of *Traditional Siapo Art* which will run through July 12, 1981. It features works by the author of this article, Mrs. Sia Malietoa of Western Samoa, and includes artifacts utilized in the making of this delicate and beautifully patterned cloth. Photographs illustrating Samoan village life accompany the exhibit. Mrs. Malietoa is demonstrating her art form in the Gallery throughout the duration of the exhibit.

measure of wealth.

Artistically, the patterned cloths presented a positive development in the sense that the role of the siapo in the cultural life of the people became strengthened. Most significantly, the siapo became a coveted item to be presented, received and exchanged at deaths, weddings and births. The making of a new chief, the erection of a new home, the fashioning of a new canoe or an ordinary family gathering all called for the use of the patterned siapo. Clearly a rich culture steeped in the observance of customary ceremonies, was the direct single power in the continuation of siapo making. Culture more significantly opened the way for experimentation in pattern variations. With culture behind it, the siapo's role in tradition assumed more prestigious proportions. Over the years, the patterned siapo evolved into the basic art form of the people.

Original designs were free-hand, to produce a cloth called the 'siapo mamanu,' worn by the women of the upper social group. The lines of the free-hand siapo were extremely delicate and simple. The colors also were indefinite. Perhaps these characteristics reflected still a non-awareness with the aesthetic side of the siapo. But it was a definite indication of a desire to adorn and decorate.

The second type of siapo produced with the advent of patterning was the 'VALA,' the traditional apparel of the Talking Chiefs or orators. Designs of the vala were produced by a rubbing process, using a patterned mat (called 'UPETI') woven from the flax of the pandanus tree.

Traditional designs depicted objects of everyday village life. These were the simple objects seen and used. The leaves of food plants and trees were simply outlined. Birds in flight were outlined depending on how it was seen and the angle it was observed by the weaver. The sky and the stars were depicted as was the sea and related objects, such as waves in motion, starfish and shells.

There were creative limits in the basic designs. Lines were not always heavy and ornate as some modern designs and though some individuality was allowed by picking out certain lines to emphasize after the rubbing process, it was still individuality bound within traditional limits.

A basic characteristic of the early siapo was a definite preoccupation with geometric designs and patterns. Some would read into this a conscious involvement with mathematics. The siapo makers, however, explain that the geometric lines were merely an easy and convenient way to reproduce what was seen. The coconut ribs and flax used in the making of patterned mats were stiff materials and not pliable enough for bending and curving. Thus the designs remained lineal, crisscrossing each other at equal distances in simple geometric lines. This way, also, they were able to get the balance they seemed to want and to produce a pleasing visual effect. But even in balance, there was a simplicity that was obvious. The geometric lines characteristic of old, served only as very simple and clean lines to represent their environment. No more, no less. In presenting their environment in lineal designs, it is clear to see that patterns were imbued with an effectiveness that was very much a part of Samoan social life.

The patterned pandanus upeti were replaced by wooden ones. As a result, designs became more rigid and bold. The delicate elegance of the early siapo was slowly but surely pushed out of fashion, reflecting the attitude that designs had to be bold and definite.

A new consciousness resulted with the use of new patterns, developing a feeling for the aesthetic and artistic value of the siapo. A definite effort was made to ac-

centuate certain sections and lines by painting over the designs. This naturally made for a certain degree of individuality even though the traditional lines persisted to the present.

The basic dye used is wrung from the bark scrapings of the 'OA' tree (*Bischofia javanica*). This is a luxuriant tropical hardwood, plentiful in the forests. A wringer fashioned from the dried inner bark of the 'FAU' tree (*Hibiscus*) is used to extract the dye from the scrapings.

This was the basic dye for color combinations and dilutions. Where the oa was scarce, root scrapings of the 'TOGO' plant (*Hydrocotyle*) gave the basic dye. The togo plant thrives in the swampy areas around the coasts and is easily accessible. Both give a lasting and glossy finish much favored by the women.

Other dyes used, though not to quite the same extent as the former two, came from the 'LOA' (*Bixa orellana*) tree, to produce a flat red color, and the 'NONU

FIAFIA' tree (*Jambosa*) gave a dye which was mixed with sea water and lime to give a rich crimson shade. Both produced combinations that were not generally favored.

Certain colors were associated with particular types of siapo. The free-hand or 'siapo tutusi' was generally given to the use of bright yellows and greens, not particularly favored in traditional siapo making. The true siapo, the 'vala,' that uses the upeti in its production, adheres

to three colors only: brown, red-brown and black.

Black is produced by mixing the basic oa dye with the burned kernel of the 'LAMA' (candle nut) tree (*Aleurites*). Blended with the basic dye, the color becomes shiny with a very lasting effect. 'ELE' or red earth sedimentary rocks, blended with the basic dye produces different shades of browns and earth colors.

At first, the design seemed to have been more important than coloring. There

seemed to have been a concentration with developing and perfecting designs rather than working at color mixtures and combinations. Today the few women who still make siapo have become relatively sophisticated in design, yet have retained the traditional browns and blacks of the original siapo.

Siapo art grew out of a need, first to provide cloth, then to provide functional parts to meet the needs of a living and demanding culture. From these mundane reasons to art works in their own right, necessarily took time and experimentation. It was done, however, with an almost fanatic persistence. The desire to decorate and beautify was a natural outgrowth of artistic development. The designs were relatively simple and crude at first, but becoming more stylized and sophisticated with time, as the siapo assumed different functions. Weaving, carving, designing and painting developed in relation, either as part of the siapo making process, or as ends in themselves. Each inspired the other, all inspired themselves unconsciously.

The scarcity of the siapo today has increased its monetary value and economically it has become an important asset. The tourist trade has given a superficial boost to siapo making. Some of the results are of very poor quality, evident in cloths that give to tearing very easily because proper care in production has not been taken. Some also have started using imported dyes that are not authentic, as well as a stencilling technique used in making designs.

In the past, siapo making by Samoan women was an integral part of village life. It was communal work, be it the preparation of a bride's dowry, or simply an excuse for a social get-together, a time for women to gossip and while away the time, while the menfolk were occupied in village decision making, fishing, planting, intriguing and warring. Then, also, the siapo was a very desirable buying and bargaining item. But with the introduction of a cash economy, this aspect of the siapo in the daily lives of the people lost some of its significance. Understandably, the art of siapo making has been rapidly dying out, to be found only at a village level in very remote parts of the islands. Aesthetically, however, this may be a positive sign in that the siapo can now be developed seriously for its artistic rather than its functional and cultural value. This way, the siapo can be presented to the art world as an art form that is not without appeal of its own, and one finally that needs to be preserved for its own merit.

Aiono Sia Malietoa is a native Samoan and a skilled siapo maker. She attended Auckland University in New Zealand, where she completed a degree in History. She is the daughter-in-law of His Highness Malietoa Tanumafili II, Head of State of Western Samoa.

The Process of Making Cloth from the Paper Mulberry Tree



1. Great care is taken in the cultivation of long straight tree trunks. Side branches are quickly broken off as soon as they sprout to prevent future siapos from having holes in them.



2. The maker carefully begins peeling off the bark at one end of the stalk.



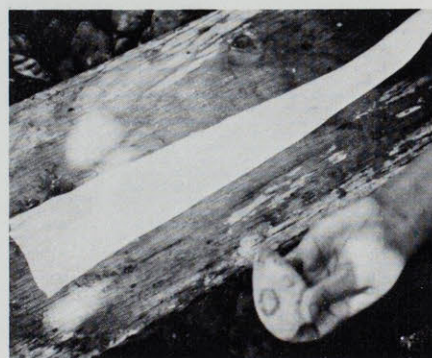
3. With the aid of her grandson, the bark is quickly stripped from the entire stalk.



4. Further stripping is necessary to remove the coarse outer layer of bark leaving only the soft and pliable inner layer.



5. Attachment of the bark strip to a board is necessary prior to beginning the cleaning and scraping process.



6. By means of a much-cherished shell passed down to her from her great grandmother, the siapo maker carefully scrapes the surface of bark to clean it and flatten it. Repeated scrapings begin to enlarge the fiber.



7. Pounding the folded bark over a log by means of a wooden beater softens and enlarges the bark to the desired size.



8. The enlarged bark is then laid out on lava rocks in the sun to dry. Once dry it is ready to be decorated.

A Living Legacy of Caring and Sharing

by DAWN HATTENBACH

Photos by JOHN DE LEON

“How much piecin’ a quilt is like livin’ a life! Many a time I’ve set and listened to Parson Page preachin’ about predestination and free will, and I’ve said to myself, ‘If I could jest git up there in the pulpit with one of my quilts, I could make life a heap plainer than parson’s makin’ it with his big words.’

“You see, to make a quilt you start out with jest so much caliker; you don’t go to the store and pick it out and buy it, but the neighbors give you a piece here and there and you’ll find you have a piece left over every time you’ve cut out a dress, and you jest take whatever happens to come. That’s the predestination.

“But when it comes to cuttin’ out the quilt, why you’re free to choose your own pattern. You give the same kind of pieces to two persons and one’ll make a ‘Nine-Patch’ and the other one’ll make a ‘Wild-goose-Chase’ and so there’ll be two quilts made of the same kind of pieces but jest as different as can be. That’s the way of livin.’ The Lord sends us the pieces; we can cut ‘em out and put ‘em together pretty much to suit ourselves. There’s a heap more in the cuttin’ out and the sewin’ than there is in the caliker.”

from AUNT JANE OF KENTUCKY
by Eliza Calvert Hall



Tumbling Blocks, an unfinished silk quilt from Mrs. Fox's collection, dates from the third quarter of the 19th century. Although the quilt is of American origin, it is pieced in the English tradition using a paper pattern to back each quilt piece.

The reverse side of Tumbling Blocks shows the paper patterns which would have been removed had the quilt been completed. The papers reveal little slices of life—fragments of children's penmanship practice as well as yellowed but still legible snatches of old books and letters.

A traditional Pinetree design is interpreted by Mrs. Fox in a festive crib quilt destined to cover a very special infant. The Pinetree design is accented by Eight-pointed Stars and a geometric quilting pattern. In the background is a New England quilt, circa 1840, also featuring the Pinetree pattern.



Each quilt executed by Mrs. Fox includes the embroidered signature, "Sandi Fox—Her Work," and the year in which the quilt was completed.



What's in a quilt besides the caliker?

According to Sandi Fox, Los Angeles craftsman and historian, the creative challenge involves using color, dimension and line to interpret designs which have been set down for years, perhaps even for centuries. The challenge includes craftsmanship which will enable the quilt to provide years—hopefully generations—of use and visual satisfaction.

Mrs. Fox, a nationally recognized authority on American quilts, has been designated an Honored Craftsman by the Natural History Museum and will be featured in a special quilting exhibition at the Museum's 1981 Craft Heritage Fair to be celebrated on June 7.

Almost every woman at one time or another has had the urge to quilt. Sandi Fox was introduced to quilting by her Nebraska grandmother in the 1930's. While still in her teens, Mrs. Fox began to sense the difference between utility quilts produced in her childhood and the careful craftsmanship and more personal expressions found in quilts of the 19th century. Thus began a passion for quilt collecting, and inevitably for quilting, that led Mrs. Fox to teach and lecture at universities, museums and art centers. In 1980 her work was presented at a one-

man quilt show at the Craft and Folk Art Museum, and most recently she served as guest curator of "Small Endearments: 19th Century Quilts for Children and Dolls," a widely acclaimed exhibition at Los Angeles' Municipal Art Gallery in Barnsdall Park.

According to Mrs. Fox, "As an English Lit and History major at Pomona, I started talking to traditional quiltmakers. My interest and my collection just grew and grew. It was never a hobby; I started out with a serious interest in the craft and developed it. This, at least, provides an answer to what happened to one English Lit major from Pomona!"

With more than fifty nineteenth century quilts in her personal collection, Mrs. Fox finds new additions difficult to come by. She blames herself, explaining that her lectures and exhibitions have helped to raise the price of antique quilts right out of the market.

There is no telling exactly when or where the craft of quilting began. Although its beginnings are obscure, it is known that crusading knights of the eleventh and twelfth centuries returned to Europe from the Middle East wearing quilted material beneath their armor. The Great Freeze of the fourteenth century—which paralyzed Europe year after year—brought the art of quilting into its own. Women responded to the need for added warmth by quilting both cloth-

ing and bed coverings. Varying greatly in different parts of Europe, the craft proliferated among farmers and gentry alike. Even the ladies of the court produced fine—sometimes extravagant—quilts.

The seventeenth century marked the beginning of the great wave of migration to the new land of America. Women from every homeland brought their patterns and skills to the New World, where quilting flourished mightily until the last quarter of the nineteenth century.

According to Mrs. Fox, American quilts created early in the nineteenth century can often be traced to a distinct geographical area. After the great Westward migration, however, regional differences became less obvious, and the strength, integrity and creativity of the pioneer women were preserved for all time in the evolution and execution of new quilt patterns.

Mrs. Fox sees in nineteenth century quilts not only the history of a developing nation but a reflection of the quality of women's lives. "Simply by the materials they used, you can generally tell a woman's status in life: whether they use the most humble of cottons with bleached flour sacks on the back, whether or not they have wonderful silks to work in, whether they are working from scrap bags—though that was sometimes the preference—or whether they have one or two newly purchased cottons through-



Using scissors and thimble passed along by her grandmother, Sandi Fox pieces a child's quilt, Tumbling Blocks.

Two to three years were involved in the completion of quilts for the 1980 one-person exhibition of Sandi Fox's work at the Craft and Folk Art Museum in Los Angeles. Crib quilts are designed by Mrs. Fox to "cover small babies, and later for them to pass along to cover their small babies."



CLOCKWISE FROM LEFT: The Log Cabin design, which uses rectangular patches of light and darker colors, may be found in many variations. A contrasting effect is achieved between the lighter and darker tonal qualities by the way in which the individual blocks are set. Mrs. Fox has chosen Log Cabin—Straight Furrow (1980 ©) for this crib quilt. (Size 23" by 28")

Quilting patterns may be combined to create exciting visual effects. Mrs. Fox chose a border of Flying Geese to enhance Wild Goose Chase (1980 ©), a popular traditional pattern. The quilt measures 34" by 34".

This visually exciting quilt features T's with Sawtooth and an Eight-pointed Star (1980 ©) borders.

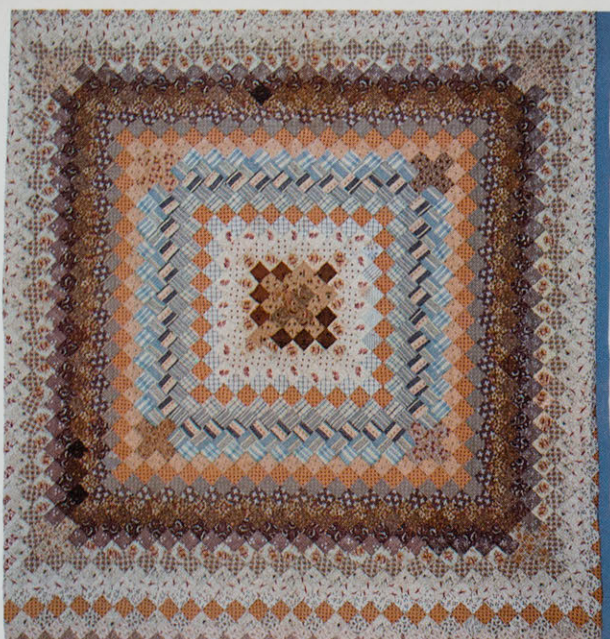
Pineapple (1980 ©), is a contemporary interpretation of one of the most striking and favored early American patterns. (Size 40" by 40")



The Natural History Museum of Los Angeles County will hold its annual Craft Heritage Day on Sunday, June 7 from 10 to 4:30. The theme, "Celebrate the Big Orange," is in honor of the Los Angeles bicentennial.

The fair will focus on skills the early settlers brought to Los Angeles. All of the artisans will be demonstrating crafts, everything from making spinning wheels, long rifles, baskets and applehead dolls to sheepshearing, metalwork and much more.

Come and join us for a wonderful *free* day at the Museum on June 7th.



TOP: Subtle tones of brown, pink and green predominate in *Around the World*, made by Emily Wright Putnam in 1896. Three grey blocks, differing greatly in color from surrounding blocks, indicate that this quilt was made for Mrs. Putnam's third grandchild.

BOTTOM: Many early American quilt patterns took their inspiration from Bible stories. Multiple Stars of Bethlehem are used in this crib quilt, circa 1850. The name *Antonia V. Griswold* faintly inscribed on the quilt is thought by Mrs. Fox to be the infant for whom the quilt was made.



out. You can tell a lot about a woman by what she chose as a basis both for design and craftsmanship and also the manner in which she worked. For example, an all-white quilt would almost never have been worked by a woman in poverty-stricken circumstances. So you can generally look at a quilt and tell something about the woman who made it. Of course, the hope is that when you acquire a quilt you also acquire some facts about it, but that is not always possible.

"There are wonderful pattern choices, reflecting everything from religious orientation to political bent. At one time there was a great debate over whether a certain rose pattern should be known as *Whig Rose* or *Democrat Rose*. And there are patterns such as *Fifty-four Forty or Fight*; *Clay's Choice*, reflecting Henry Clay's popularity on the political scene; and *Tippecanoe* and *Tyler Too*. It is not that you can see a *Tippecanoe* or *Tyler*, because the patterns are abstractions, but giving them a title meant the woman cast about for something that was important to her. Of course, women had always been politically active in this country in

terms of thought even before they had the right to vote. I'm certain they had a great deal to say in pillow talk.

"In homes that could afford it there was, in addition to a group of utility quilts, a 'best quilt,' a quilt that was brought out when the mother-in-law came to visit, or when the minister was paying a call, or when you wished to impress your sewing circle. The best quilt was generally also functional, but it was more elaborate and put out for the purpose of beauty rather than practicality.

"When looking at a quilt, you can look for craftsmanship and you can look for pure visual design. For me, the quilt really has to speak to me. It has to say something about the woman who made it. I have to get a sense of her pleasure in the craft. If I get that, and must settle for slightly less than perfect craftsmanship, it pains me—but I can live with it."

In this machine age, a contemporary handmade quilt can still weave a potent spell.

Quilts produced by Sandi Fox have been displayed in numerous museums and featured in books and on television.

Mrs. Fox is a "lap quilter" and there are few times her fingers are not busy piecing or quilting another original creation. Although she has produced a number of large quilts, Mrs. Fox finds herself more often working in child-size quilts.

"I guess I have become increasingly influenced through the 'Small Endearments' exhibition," she explained, "feeling that these are the most precious quilt pieces. I have even gone back to the more traditional early nineteenth century format which is a square dimension as opposed to rectangular.

"I work on my quilts all the time and usually have several in process. Although I occasionally undertake a commission, primarily I quilt for *pleasure*, and when I begin a quilt I have no idea how long it will take to complete. I obviously take great pride in what I do, but I hope that the pleasure of the craft as well as the pride comes through in my work."

Children's quilts executed by Mrs. Fox emphasize strong design and bold color and are usually worked in earth tones. Her quilting patterns are highly geometric, adding another linear element to her designs. Because of her passion for natural fibers, she works only in fabrics of one hundred percent cotton, even preferring cotton batting. Following the old needlework tradition that only God can create perfection, each quilt contains a "religious error" deliberately executed either in the design or in the quilting. The location of the error is not revealed.

Mrs. Fox does not produce quilts commercially, although she mounts a one-man show about every two to three years at which her quilts may be sold. Prices for a baby quilt range to approximately \$1,500.

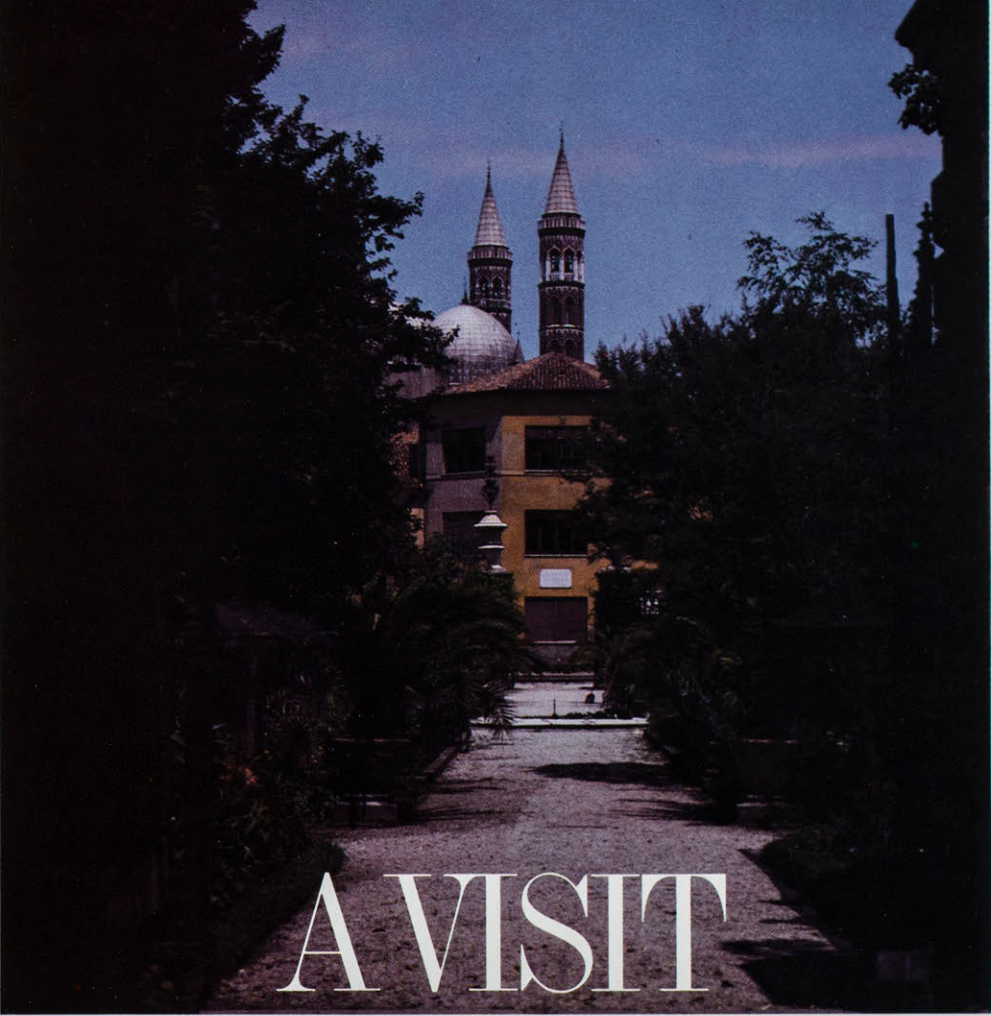
How can she part with a "small endearment?"

"I am able to reconcile myself to giving up something that has occupied a great deal of my time and thought because my quilts are made to last—that's what I stress. I am doing them in techniques that insure with minimum care, they will be around a hundred and fifty years from now. Through them I will speak to a woman who has pleased in them herself, and then passed them on to someone who will also experience pleasure.

"It makes one almost heady to have enough confidence in your craft to really feel that it is something that is beyond 1980—that the pattern, the line, the quality itself is going to speak to someone a hundred and fifty years down the road and say: 'This is someone who cared about what she did. Not just that she *did* it, but that she *cared* about it.' And that would please me very much."

Dawn Hattenbach is a touring docent at the Natural History Museum. In her pre-docent days she was manager of public relations for Whittaker Corporation in Los Angeles.

A vista of the garden. The Basilica looms above the verdure.



A VISIT

to the World's Oldest Botanical Garden

by WILLIAM A. EMBODEN

The small town of Padua is visited by pilgrims from all over the world who come to the shrine of Saint Anthony, which is housed in a majestic edifice comparable to Saint Mark's Basilica in Venice. This massive bastion of Romanesque and Gothic architecture dwarfs all that is around it, and silhouettes of eight domes, two bell towers and two minarets challenge the sky. The entire edifice, begun in 1232, was finished in about 1300. For many centuries it was the principal reason for a journey to Padua.

Botanists are a peculiar lot, and their pilgrimages are more often secular than pious. A palm may occasion a journey to a tropical island, or the tundra of the Antartica may call for reason of an unusual moss or a new lichen. In some instances, it is the recreation of a period in the history of botany that will draw a plant person from his native soil to "outlandish" regions. It was just such an adventure that

I undertook in July of 1980. Having bathed in Venetian splendor for a week, I forsook my 15th-century palazzo and the aqueous delights of that city for a journey to the world's oldest botanical garden in Padua, only 25 miles to the west.

Padua is most picturesque with its arched streets and the numerous small bridges that cross the serpentine branches of the Bacchiglione River, which once surrounded its ancient walls. When one arrives at the train station, it is best to set out on foot across the city in order to be properly distracted by such astonishing sights as the chapel of the Madonna dell'Arena (also known as the Annunziata), with its walls entirely covered with frescos by Giotto. In meandering toward the garden, one passes the University of Padua founded in 1222, and numbering among its professors such luminaries as Bembo, Vesalius, Galileo and Tasso. When Padua passed into the hands of the Venetian rulers in 1405, the

University was already one of the great seats of learning.

Professor Francesco Bonafede occupied the first chair of *Lectura simplicium*, or lecturer on simples, at Padua, and the first in all of Europe. Simples are herbs of medicinal value, and Bonafede was of surpassing intelligence in lecturing on the value of these plants. It soon became apparent to him that the University required more than abstract concepts of simples as medicants, and so he began a chair of *Ostensio simplicium*, to deal with the practice of using medicinal herbs. In order to effectively do so, he made the Venetian Republic aware that it would be necessary for Padua to have a place to grow these plants from sundry parts of the world. The Senate of the Venetian Republic approached the monks of St. Giustina, who owned land just adjacent to the Basilica of St. Anthony, and asked that they rent 3.44 acres to the University for the purpose of a garden

that would serve all of Padua, and especially the students in the University. This was granted for an annual sum of 25 ducats, or about 200 dollars per day.

The Venetian patrician, Daniele Barbaro, and Professor Pietro Noale planned the gardens, which were executed by the famed architect Giovanni Moroni of Bergamo. Moroni was at that time engaged in the construction of the church of St. Giustina. The gardens were constructed in such haste that by 1545 a decree was issued for their construction, and within a year they were in use by students at the University. They began with the ground plan and plantings. The great circular walls surrounding the gardens were not initiated until 1551. These were followed by the marble balustrade, and other adjuncts were added up to the year 1707.

When students began to use the garden, it was necessary to have a director present, since the gardens were about half a mile from the University proper. Luigi Squalerno, also known under the name Anguillara, was the first director of the Gardens, and from 1546 to 1561 served as "Plant Expert and Teacher of the Padua Medicinal Gardens." His successors were to be among the most distinguished botanists in all of Europe—Wieland, Cortuso, Alpino, Wesling, Dechamps, Pontedera, Arduino, Sesler, Marsili, De Visiani, Saccardo, etc. Wolfgang Goethe visited the Gardens in 1786 and lectured on Botany. A palm (*Chamaerops humilis*) that he planted is still growing and is known to all as "Goethe's palm." Goethe will be remembered for his fine writings on botany and his remarkable observations on plant metamorphosis. He will be equally remembered for setting the elements of botany into poetic form, so that versified, his wife Christine Vulpins might remember something of botany.

By the year 1552, 1500 cultivated species of plants having medicinal attributes were cultivated in the Gardens. By 1854 they numbered over 16,000. About half of that number are alive in the gardens today. This garden became the leading garden in all of Europe, and it supported all of the new introductions from diverse areas of the world. It was here that the sunflower (*Helianthus annuus*) was first grown in 1568, the potato (*Solanum tuberosum*) in 1590 and rhubarb (*Rheum raphaniticum*) in 1612. Not all of these new plants had medicinal value, but they were introduced and tested. Whether useful or not, they were usually dispersed about Europe to grace other gardens. We should remember that the sunflower that was taken from the Americas as a small weed was developed into its giant form by Europeans, who prized the oil of the seed. The rhubarb was cultivated for reason of its cathartic properties. The eggplant that is known as *melanzana* or "mad apple" in Italy was grown for many years before any dared to taste its flesh, for fear that they would go mad. Fortunately the repu-

tation was outlived, and "madapple pasta" is one of the great treats of the region of Padua.

The Institute of Botany was built and rebuilt several times beginning in 1644. It was to serve as a library to house rare books and manuscripts on plants as well as a place to study dried plants—the herbarium. Today the Institute houses over 5,000 volumes and almost half a million dried and pressed plants. No mouldering botanists here, rather a collection of astute scientists from all over the world. The Botanical Institute of Padua remains one of the great seats of learning in the botanical sciences.

I approached the walls of the Garden and the Botanical Institute as a novice of sorts. I had made no arrangements and had no introduction but my card bearing academic credentials. Since I was a Fellow of the Linnean Society of London, a part of the Royal Academy, my credentials were acceptable. In the foyer I waited while my card was passed from hand to hand, and shortly I was greeted by the benevolent figure of Dr. M. Orsenigo, whose work on the development of plastids in the leaves of corn is well known throughout the world. He introduced me to scientists who were exploring every aspect of the discipline of botany from algal pollution to vegetation mapping. His own work kept him busy with a fine new electron microscope. As his guest, I was shown the magnificent library of the Institute where I was able to peruse manuscript volumes as though they were as abundant as newspapers. It was a library of great treasures capturing the entire history of botany. Dr. Orsenigo related how he had rescued an entire box of first editions of Linnaeus and others from the obscurity of an over-heated attic. They were thought to be of little value in light of the quality of the rest of the collection. Besides, there were duplicates of all of these volumes. An embarrassment of riches was evident.

The herbarium boasts some of the first plant collections ever made in Europe. Most of these are still kept in their original form as a sort of book of dried plants. Lichens and algae are not ignored in this collection, and well over one-third of the material consists of non-flowering plants.

With typical Italian generosity, I was gifted with stacks of reprints of the work of individuals in the Institute as well as a guide to the gardens. I was reminded by Dr. Orsenigo that although I had glanced at the holdings of the Botanical Institute, I had not yet entered the walls of the world's oldest garden. Although it was lunch time, I was oblivious to hunger. I would sate my desires by viewing the dream of Bonafede and his successors.

I entered the gates recalling the rules established by Daniele Barbaro, whose idea it was to have such a garden. These rules were engraved on marble tablets

over the pillars of the entrance:

1. Do not knock at this gate before the day of Saint Mark the Evangelist (April 25), nor before 10 a.m.

2. Do not let those who have entered (presumably for the lecture) to wander outside the garden wall.

3. In the Gardens it is forbidden to break stems and branches, to pick flowers, to collect seeds or fruits, or to dig up roots.

4. Do not tread upon small plants; neither trample on flower beds, nor walk on them.

5. Do not permit the Gardens to be otherwise damaged.

6. Let nothing be done against the Director's will.

7. Trespassers will be fined, imprisoned and banished.

To be banished from this Garden would be the classical expulsion from paradise. I walked carefully, observant of small plants and flower beds. The perfect symmetry of the place gave it a harmony undreamed of. Visitors were absent except for a romantic young couple, and the only sound was that of a fountain spilling water into a basin. Areas in the garden are numbered from I to XXI, and the ideal tour is to follow these numbers. It would be impossible to enumerate the holdings in each quarter, but some sections must be praised. The *Nymphaeum* or pond with water plants is number VI, and it is a collection of about fifty plant species that are arranged according to their time of bloom. In this are the aquatic plants typical of Venetian beaches and lagoons. As with all of the garden, each plant is clearly labeled with its Latin binomial, the family name, the country or province from which it emanated, and in some cases the year that it was planted.

As I entered Section VII, Goethe's palm, the dwarf *Chamaerops humilis* (now over 400 years old), stood before me in a peculiar octagonal greenhouse that was open for the summer. It is near an ancient sundial. I glanced at the nearby citrus species and thought of Goethe's exquisite verses "*Kennst du das Land, wo die Zitronen blühen.*" His longing for Italy eclipsed all love for his native land, and it is easy to understand. In his extensive writings, Goethe left an account of how he fled the dismal Weimar to study "the infinite variety of life" in Italy. Descending from the Brenner Pass, Goethe was awed by the wealth of vegetation that was entirely new to him, but that enthusiasm reached its highest peak when he visited the Botanical Gardens at Padua. The idea that plant growth was dependent upon external influences had crossed his mind while he was still in Weimar, but at Padua the hypothesis developed into a certainty. It was the very *Chaemaerops* palm that I stared at that led Goethe to formulate his observations on complex developments of leaf forms in one and the

same plant. He had the gardener cut several of these leaves for him. They were kept as proof of such transitions. This stood in opposition to the Linnean doctrine of immutability of plant species.

It was probably the student body at Padua that had the first opportunity to listen to Goethe's exposition of the rudiments of that which would develop into the *Urpflanze* theory based upon the hypothesis that all is leaf, and it is this very simplicity that makes possible the greatest diversity. I stood before this very palm that initiated the concept of morphogenesis in one of the keenest minds in history. Perhaps only a botanist can enjoy such profound private pleasures. What might have been the fate of these rudimentary ideas had they not been inflamed by the wealth of vegetation at these very Gardens?

I passed on to area VII which is a collection of pharmaceutical plants. It was this very garden that had long grown plant introductions that kept the citizens of Padua and environs in a state of health. After an early twentieth-century monopoly on drugs by the pharmaceutical industries, we are returning to a study of many of these same plants and their very important roles in curing everything from dermatitis to cancer. I marveled at how well tended these beds were, free from weedy invaders and so very well labeled. It is the envy of all such gardens.

TOP: The aquatic gardens include an unusual deep rose-colored *Nelumbo nucifera*.

MIDDLE LEFT: A tree *Datura* (*Brugmansia*) reveals large pendulous pink flowers.

MIDDLE RIGHT: A novel new introduction into the garden is a scarlet-flowered *Punica granatus*, a pomegranate.

BOTTOM LEFT: Medical gardens still include the important *Papaver somniferum*, the only source of opiates.

BOTTOM RIGHT: The African water lily *Nymphaea stellata* graces the quiet lily ponds.



Moving through the collection of grass, garlic and pink plants, I gazed upon the balustrade to see the busts of some of the great figures in the history of botany: Colonna, Saraceno, Alpino, Pontedera and Marsili, most of whom had occasion to teach at these gardens. In the Quarter of the Lebber Tree, as it is called, I surveyed some exquisite opium poppies in full bloom as well as mustards, roses, cinquefoils and other loosely aggregated species.

In the Magnolia Quarter, I viewed the first magnolia tree introduced into Italy in the year 1786. All about it were umbelliferous plants and a host of figworts. On past the irises and through the alley of peonies I chanced upon *Coffea arabica*, the coffee tree, and an equally demanding tree datura (*Brugmannsia aborea*). I then veered upon a trail that abutted upon the famous plane tree (*Plantanus orientalis*) planted in 1680. The trunk was eroded away by age and one could step into the dark interior chamber that had once transported water and nutrients. It is this tree that is being celebrated on its 300th anniversary, and the government of Italy is issuing a postage stamp in its honor—a gesture that other countries might find strange.

Coming upon the handsome South Gate, I studied the pond with a host of

The Botanical Institute and Octagonal Glass House.

water lilies and photographed some that I was using in my current research. Looking up, I found myself under the beneficent marble gaze of the great father of botany Theophrastus, who was born on the island of Lesbos in 372 B.C. and who was nurtured by the teachings of Plato and Aristotle. I worked my way through a thicket of yews to the East Gate, where Time and the Four Seasons greeted me as allegoric statues about a pond surrounded by pines. Through the thorns and meadowsweet, I spied the alpine gardens that are founded on imported calcareous rock and siliceous stone. There was the deadly *Aconitum napellus* or wolfbane in full bloom with its dark blue hoods being invaded by bees. Gentians, windflowers, saxifrages, houseleeks, alpine poppies—and all of those plants from the eastern Alps, the Venetian pre-Alps and other montane areas were around me.

The *Tepedaria* are warm houses that contain magnificent collections of orchids and rare tropicals as well as a number of plants that might be seen thriving in southern California gardens.

I had finally arrived at the North Gate where all of this had begun and departed with reluctance. As I walked outside of the wall, I spied the ancient “chaste tree” (*Vitex agnus-castus*) planted in 1550, whose virtues included a deadening of sexual desire. I found that the plant had outlived its reputation. As I passed in

front of the Institute, I looked upon the entablature at the marble busts of Linnaeus, Tournefort, De Jussieu, Malpighi and Bonafede, the first Professor of Botany at the University of Padua. I made my way across the Alicorno canal and walked to the Basilica of St. Anthony. In the cool cavernous interior of this giant edifice, I could contemplate the extraordinary pleasures of that day and view a fresco of Saint Anthony preaching to a school of fishes. Perhaps the eccentric pleasures of botanists are paralleled only by the equally eccentric pleasures of saints.



William Emboden is a research associate in Botany at the Natural History Museum and a research associate in the Botanical Museum, Harvard University. His forays provide him with insights into exotic plant life and places. He is currently working on ritual uses of narcotic water lilies.





CALIFORNIA COASTAL INSECTS

Another Vanishing Community

by CHRISTOPHER D. NAGANO

COASTAL INSECTS

A recent government study found that seventy-five percent of the California coastline has been radically altered by man, who is responsible for the rapid deterioration of the natural environment. Urban development, pollution, and increased recreational use are virtually uncontrolled.

Indispensable, though generally unrecognized, components of the seashore ecosystem are insects. These animals perform many important functions. They serve as food sources for birds, mammals, and other vertebrates; they regulate vegetation; and they pollinate plants. Furthermore, some insects are extremely sensitive to the harmful effects of human civilization and are excellent indicators of the health of the environment.

Insects have never successfully colonized the open ocean because of a combination of biological, chemical and physical barriers. However, the strip of land bordering the sea is inhabited by a myriad of varied types. Salt marshes, mudflats, and the deposits of the drift line are a few of the many habitats occupied by seashore insects in California. These and other coastal insect habitats are part of three basic ecosystems: estuaries, beaches and sand dunes.



The Antioch Shield-back Cricket (Neduba extincta) is the symbol of the destruction of coastal sand dunes in California. The species was extinct before it was known to science. Watercolor by Dr. Charles L. Hogue.

ESTUARIES

An estuary is formed where a stream or river meets the ocean. Silt and mud are deposited at the mouth of freshwater sources and become populated by plants and animals specialized for this environment. Saline conditions affect the plant and animal life inland as far as seawater is pushed during high tides. Most of the estuaries on our coast have been dredged and made into shopping centers, marinas, and housing tracts. The once-unique and extensive insect faunas are now essentially gone.

The Sweetwater River mouth in San Diego County and Coal Oil Point in Santa Barbara County are among the few remaining estuaries in a natural state on our coast. Here many insects, such as brine flies, salt marsh mosquitoes, and water boatmen are found in the saline or brackish waters and persist as reminders of once greater past populations at the many other such salt marshes now gone.

The Salt Marsh Water Boatman (*Trichocorixia reticulata*) has long oar-like legs which are used to propel its boat-shaped body through the water. This insect is a conspicuous and abundant inhabitant of the coastal estuary. It is among the few species of this family that can survive in a saline habitat, for which



Sand wasps (*Bembix*) are common inhabitants of sandy beaches and dunes. This female is wrestling a "boulder" preparatory to excavating a burrow in which to rear her young. Photo: Charles L. Hogue.

Ecologically damaged sandy beach at Leucadia in San Diego County. Vehicular traffic, recreational use and kelp removal have nearly destroyed all insect life on this narrow strand. Photo: C. D. Nagano.



it has evolved specialized adaptations to deal with widely varying ionic concentrations. The Salt Marsh Water Boatman feeds on algae and protozoa and in turn is an important food source for many other animals.

A coastal insect well-known for its persistent blood-sucking habits is the Southern Salt Marsh Mosquito (*Aedes taeniorhynchus*). The larvae of most members of the mosquito family can only live in fresh water, but this species tolerates conditions of rapidly changing and high salinities. It can do this because of highly effective, active osmotic regulating systems which filter out excessive salts from its body.

Perhaps the most common estuarine insects are the brine flies (*Ephydra*). The aquatic larvae of these small, dark-colored gnats feed on microorganisms inhabiting the mud and decaying organic material on the bottom of salt-water pools. This group of flies is widespread in North America wherever there are highly saline water conditions. Brine flies, along with the water boatman, hold a position near the bottom of the food chain of the estuary and thus are an important food source for predatory insects, fish, and many types of shore birds, such as herons, sand pipers and killdeer.

BEACHES

The beach is a habitat extending for many miles along the coast, but is only a few hundred feet wide. Biologists and biogeographers are interested in the linear nature of sea beach insect distribution.

Many rocky and sandy beaches have been rendered totally inhospitable for seashore insects by man's activities. At one time, dozens of species of flies, beetles and other invertebrates were found in this habitat. It is an intertidal ecosystem based on masses of seaweed that wash ashore from marine kelp beds. The seaweed supports several species of kelp-feeding flies, which are in turn fed on by many predators. The practice of removing the kelp for aesthetic reasons has all but eliminated this community from most beaches in California.

The larvae of the harmless kelp flies (*Fucellia costalis* and *Coelopa van-duzei*) feed on the decaying seaweed and therefore perform the important ecological job of organic decomposition. *Fucellia* and *Coelopa* are among the most numerous of coastal insects. One scientist estimated that some California beaches have as many as 10 million flies per kilometer under favorable conditions. These insects are relatives of the mosquito and housefly, but do not share the noxious habit of biting people or carrying disease. The larvae and adults of kelp flies are fed on by sea birds and mammals and thus are essential in maintaining these more visible and appreciated life forms.

Rove beetles (Staphylinidae) are com-

monly found on sandy beaches under masses of stranded kelp. Only a small portion of the 2900 North American species inhabit our coastline. They are elongate, predaceous insects and active runners. A study of intertidal rove beetles found that they are important predators of kelp flies. But there are only a few coastal areas left in California where these beach-inhabiting beetles are still common.

Members of other insect groups are restricted to rocky portions of beaches. Among these are springtails (Collembola) which are seldom observed because of their minute size. They are one of the most ancient and primitive insects known, tracing their beginnings back to the Devonian Period, some 400 million years ago. The furcula, an organ which enables them to jump great distances, gives these insects their descriptive name. The Marine Springtail (*Entomobrya laguna*)—first discovered in the tide pools of Laguna Beach in Orange County—inhabits only the intertidal region in rock crevices where it probably feeds on marine algae. It can survive total immersion in sea water during high tides.

Many species of midges or harlequin flies (Chironomidae) live in the intertidal region. Their larvae are among the few insects to have become true inhabitants of the ocean and even form a part of the diet of tide-pool fish. These minute animals inhabit rocky beaches, where they feed on algae and planktonic sediment. Several freshwater species are very sensitive to pollution and are used by scientists as indicators of environmental health. Since little is known about the biology and ecology of marine midges, they remain fertile fields of study for entomologists and marine biologists.

SAND DUNES

Coastal sand dunes constitute an endangered ecosystem that soon may be totally gone from California. Biologists are unable to study adequately the dunes and their unique wildlife, because this habitat is being rapidly destroyed by ill-planned urban growth and off-road vehicle (ORV) traffic. And, as yet, biologists do not have an adequate understanding of the ecological relationships of the insects to the rest of the flora and fauna of the dunes, nor do they have adequate knowledge of the insect species actually existing there.

The Antioch Shield-back Cricket (*Neduba extincta*) is a good example. A lone specimen collected almost a half century ago on the formerly extensive Antioch Sand Dunes recently was found preserved in a museum. Since the time of its capture, urban growth and sand mining have reduced the dunes to a tiny fraction of their original area. Despite intensive searching by entomologists, *Neduba extincta* has not been found again. It was extinct (as its name implies) before it was

known!

The origin of the Antioch Dunes, located on the banks of the San Joaquin River by the town of Antioch, is unknown. Some geologists feel they were created during the ice ages when sand transported by the San Joaquin River was deposited and then piled by winds at its present site. Others theorize that the sand dunes had a more complex beginning, being caused by a combination of flooding, climatic change and fluctuating sea levels and were once coastal.

Although the Antioch Sand Dunes are not presently coastal, they are included here because they are a typical example of what is happening to this type of ecosystem. The factors in their creation are disputed, but the presence of many endemic plants and animals is not (endemic means found inhabiting a specific area and nowhere else). Several of these, such as Lange's Metalmark Butterfly (*Apodemia mormo langei*), enjoy government protection because of the danger of extinction. Despite close proximity to the ocean, the biota has many affinities with southern desert areas. The further study of the relationships that the insects have with species in other regions may shed light on the origin of the dunes. Unfortunately, unless the area is saved from destruction, we will never have a chance to know the answers.

The late Dr. W. D. Pierce, former curator of Entomology at the Natural

History Museum of Los Angeles County, was especially interested in a genus of snout beetles (*Trigonoscutea*) inhabiting coastal and inland sand dunes of California and adjacent Mexico. During the daytime, these insects burrow into the sand to escape the extreme heat and predators, returning to the cool surface at night to feed on dune vegetation. *Trigonoscutea* live on nearly all coastal dune systems, but a number of species are found far from the ocean in the Mojave and Colorado deserts. They represent relict populations that once lived around the shores of ancient seas which dried up eons ago. Dr. Pierce found that the geography of the prehistoric coastlines could be correlated with the presence or absence of *Trigonoscutea*.

The Xerces Blue Butterfly (*Glaucopsyche xerces*) and the Sthenele Satyr (*Cercyonis sthenele sthenele*) Butterfly are two extinct coastal butterflies that were found only on the sand dunes of the western San Francisco Peninsula. The Sthenele Satyr disappeared in the late nineteenth century before its biology was known. What is more, most of the pre-

The El Segundo Sand Dunes located at the west end of the Los Angeles International Airport is the home of the El Segundo Blue Butterfly (Euphilotes battoides allyni), an endangered species. This locality is a small remnant of a once extensive coastal sand dune system. Photo: Julian P. Donahue.



served specimens were in San Francisco's California Academy of Sciences and were destroyed in the 1906 earthquake. The Xerces Blue survived into the early 1940s, but it too succumbed to "progress." Less than one hundred years after their discovery, both of these butterfly species were annihilated when the rapid growth of the city destroyed their habitat. By the time it was realized the insects might be in trouble, they were already gone.

On the western edge of the Los Angeles International Airport lives the El Segundo Blue Butterfly (*Euphilotes batoides allyni*). At one time it was probably widespread on the sand dune system extending from Playa del Rey to Torrance, but as the dunes were reduced in size by growth of the city, so were populations of the El Segundo Blue. The habitat of this butterfly is now restricted to a few small acres between Dockweiler Beach and the airport. Urban threats and the possibility of airport expansion have convinced

the government to give the insect Endangered Species status. If this action does not save it, an animal found nowhere else on the entire planet will join the ranks of the Dodo, Passenger Pigeon and the Bali Tiger.

NEW DISCOVERIES

In 1975, another coastal butterfly from southern California was considered by the federal government for Protected Species status. An inconspicuous, brown-colored insect with a wingspan of barely one inch, the Wandering Skipper (*Panoquina errans*) is found from Santa Barbara south into Mexico. *Panoquina errans* inhabits estuaries in close association with Salt Grass (*Distichlis spicata*), the foodplant of the caterpillar. Habitat destruction in the form of marina and harbor construction is the main cause of decline in this insect. Examination of collection records in the Museum reveals this once-common butterfly is now rare.

Like their mammalian namesake, tiger beetles (*Cicindela*) are fierce and voracious predators. The adults actively search out and attack their prey which includes flies, ants and any invertebrate the tiger beetle can overpower. *Cicindela* are among the most important members of the estuary and beach ecosystem. Because of their integral part in these communities, they are extremely sensitive to any harmful interference by man. Many

populations have been totally eliminated by coastal development, uncontrolled pesticide spraying and ORV use.

The biology and ecological impact of many insects unique to the coastline is just beginning to be understood by scientists. We recently discovered a colony of an extremely rare wingless wasp on a coastal sand dune system in Los Angeles County. Known to entomologists as *Brachycistis*, these animals have been found very rarely on the seacoast. Only through the use of special trapping techniques were we able to detect them.

The numerous other insects restricted to the seashore must largely remain unstudied. Because few funds for field work are available to study coastal insects, like the Antioch Cricket, many species may be discovered too late.

A FUTURE FOR COASTAL INSECTS?

The estuaries, beaches and sand dunes of California represent special ecosystems for insects found nowhere else. Within a very few years, at the present rate of human population growth, the only natural seashore habitats will be in small nature refuges, a few parks and military preserves. The number of kinds of insects gone forever may be very high.

Recently a scientist made a seemingly contradictory point about the conservation of insects of the disappearing coastal environment. Since their habitats are being destroyed, extensive surveys of the insects should be made, and large samples of the species taken so that future scientists can study them. I whole heartedly support this proposal since many localities in California are now sterile ORV wastelands, housing tracts and harbors. We do not have a complete picture of what the biology of these areas was and now that they are gone, we never will.

The Entomology Section of the Natural History Museum of Los Angeles County is attempting to gather information on the ecology, biology and, more basically, an inventory of the species that inhabit the seashore before they vanish. We have begun intensive surveys of the insects found at Ballona Wetlands near Marina del Rey and the lagoon within the Point Mugu Naval Air Station.

The ecological future of the California coastline may seem dismal, but with hard work by conservationists and scientists, we may still save significant remnants of our estuaries, beaches and sand dunes.

Christopher Nagano is a graduate student at the University of Southern California and a Research Associate in the Entomology Section of the Natural History Museum of Los Angeles County. He is currently investigating the biogeography of the insects inhabiting the California Channel Islands and the ecology of coastal tiger beetles.

Point Mugu Lagoon, Point Mugu Naval Air Station located in Ventura County. Because of the protection of the United States Navy this is one of the few remaining estuaries in a natural state on the entire coast of California. It is inhabited by many rare insects including the Wandering Skipper (*Panoquina errans*), tiger beetles (*Cicindela*) and several species of sand dune inhabiting crickets (*Neduba species*). Photo: Carl Gage.



THE VERSATILE ELK

Not infrequently a curator is consulted on some unusual matters, but it's not every day that one gets to assist in the investigation of a possible homicide. My latest experience as a sleuth came some weeks ago when I was consulted by Dr. Robert P. Kelley, a consulting dental pathologist for the Coroner's office of Orange County.

It seems that three people, A, B & C, worked together and were friends. Lady A, of Mexican extraction, prepared a special meat dish and brought it to work to share with B and C. B didn't like the dish and consequently did not eat much. C was eating her way through the serving when, to her dismay, she discovered some teeth and bone fragments. When confronted with the disquieting objects, lady A would not disclose the source of the meat dish; instead, she demanded the teeth and bone fragments be returned to her. Their suspicions must have been great, for B and C reported the case to the Coroner's office as a possible homicide and turned over the teeth as evidence. These, in turn, were ultimately brought by Dr. Kelley to me for identification.

No, the two teeth were not from a human or any other primate. But what were they from? My original guess was that they were elk teeth, but just to be sure we spent part of the morning eliminating such obvious mammals as pig, goat, sheep, cow, horse and deer as well as other, unlikely species. Dr. Kelley was finally convinced when the teeth matched perfectly two of the lower incisors (front, nibbling teeth) of the lower jaw of an elk. It's my hunch that the elk was shot illegally, and that's why lady A would not reveal the type of meat and why she wanted the teeth back.

When we parted, Dr. Kelley indicated that B and C would sure be relieved to learn that they had only partaken of elk. He didn't think they were particularly friendly with lady A anymore, either.

Strange as this case was, it wasn't my only experience with elk teeth. Several years ago I was consulted by Dr. Reidar Sognaes, Professor of Anatomy and Oral Biology at UCLA, who was studying the numerous sets of false teeth used by George Washington. In one particular set, the teeth of some mammal had been reworked and reshaped slightly to resemble human front teeth. Yes, you guessed it, they turned out to be the lower incisor teeth of an elk.

Donald R. Patten
Curator of Mammalogy

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Make checks payable to Museum Alliance. Mail to Natural History Museum Alliance, 900 Exposition Blvd., Los Angeles, Ca. 90007. Alliance Information: (213) 749-3631.



APPLIQUES FROM COLOMBIA...

Two major events on our Museum's calendar are the Craft Heritage Fair on Sunday, June 7th, and the Colombian Gold Exhibit opening July 4th. The Museum Shops coordinate by offering handcrafted appliques from Colombia. Brightly colored fabrics are carefully stitched to recreate charming scenes from the Colombian countryside. These appliques come in all sizes and can be used in many imaginative ways: as decorative patches on clothing, as squares on a quilt, or as dramatic wall-hangings.

From \$6.50 to \$125.00

THE ETHNIC ARTS SHOP
Natural History Museum
900 Exposition Blvd.
Los Angeles, Calif. 90007

THE PAGE MUSEUM SHOP
George C. Page Museum
5801 Wilshire Blvd.
Los Angeles, Calif. 90036